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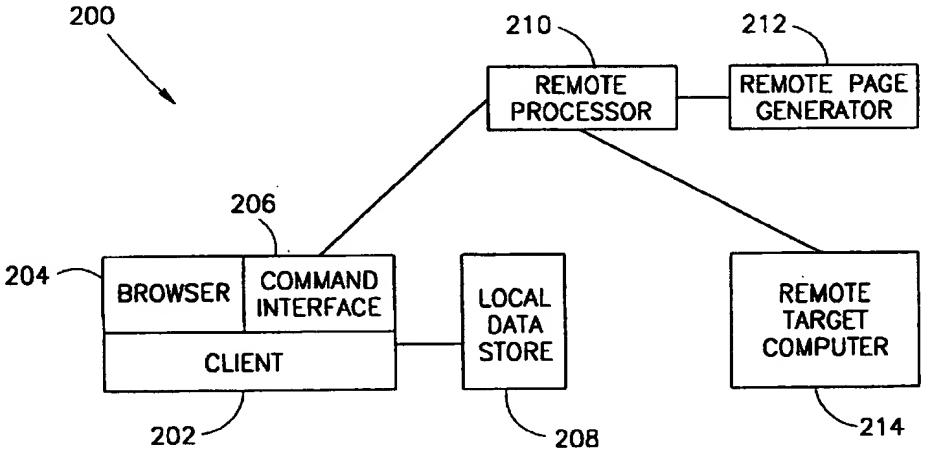
(54) Title: USER INTERFACE METHOD



(57) Abstract: A method of entering a command comprises providing a world wide web browser (204) having a designated URL field (106); entering a text string representing a command in a format which is neither a standard URL nor a portions thereof, into said designated URL field (106); and translating, by machine said command into at least one action.

WO 01/06393 A1

USER INTERFACE METHOD

RELATED APPLICATIONS

This application is a continuation in part of the following PCT applications: serial numbers PCT/IL99/00055, PCT/IL99/00056 and PCT/IL99/00399 and a 119(e) of US provisional application 60/103,473, filed by same applicants, the disclosures of which are incorporated herein by reference.

FIELD OF THE INVENTION

The present invention is related to the field of Internet access and in particular to methods and apparatus for using Internet tools to interface with computers.

BACKGROUND OF THE INVENTION

Controlling remote computers via the Internet is known. In a typical example, a user enters information in a WWW page and this information affects the operation of a remote computer. The information may be text, entered in special fields on the display or the information may be entered by interaction with graphical objects, such as maps and buttons.

A URL address field is currently designated for entering URLs (Uniform Resource Locators) and displaying the current URL of a displayed WWW page. Various types of URLs exist, all of which have a rather limited format. In general, URLs used to addresses of WWW pages or addresses of other resources on the Internet. However, there are other types of standard URLs. A particular non-address type of URL is a "mailto" URL, which will generally activate a local mail program, possibly with message fields such as an addressee and/or subject filled in. Another particular type of URL is a "cgi-bin" URL, which includes information and parameters for a particular executable to be executed at the remote site. Generally, these URLs are long and obtuse, require special knowledge, and are thus inputted by manipulating a WWW page that generates these URLs when certain buttons are clicked on and/or fields filled in, rather then by typing into a URL field.

SUMMARY OF THE INVENTION

An object of some preferred embodiments of the invention is to provide a straightforward and uniform method for interacting with computers, preferably utilizing existing browser interfaces. Preferably the method integrates interfacing to local and remote computer resources.

An aspect of some preferred embodiments of the invention relates to using a URL field of a browser to enter commands in a non-URL format, possibly even in non-Latin languages. In a preferred embodiment of the invention, the commands are directed to actions, other than page retrieval. Examples of actions include, modifying files, copying data and executing

programs. Alternatively or additionally, the commands may comprise instructions to the translation system, to the browser itself, to an operating system or other software running simultaneously with the browser on the local computer. Optionally, the interpretation of the command is dependent on a history of previously entered commands and/or displayed pages. These commands may include explicit commands, for example a copy command. Alternatively or additionally, the command is implicit. Preferably, the command is determined based on the type of data, for example if a telephone number is entered, that number is dialed and if an e-mail address in entered, an e-mail program is started. Optionally, the determination of the type of information and the suitable command is dependent on a context, as described below.

An aspect of some preferred embodiments of the invention relates to providing a user interface to WWW sites and/or software packages. In a preferred embodiment of the invention, a same or similar user interface is provided for a plurality of different software packages, thus making them easier to use. In a preferred embodiment of the invention, the provided interface is a command interface utilizing a URL field of a browser. Commands entered in this field can be used to control various aspects of displayed WWW pages, including controlling data displayed by for sites where there is no control or the control is graphical. In one example, a standard command of "show local" modifies the displayed page so that only local information is displayed. This command may mimic a button that is provided with the page. In another example, the page may be automatically generated by a remote site based on cookies at the user. The command can be used to modify the cookies so that a different page is generated. Alternatively or additionally, to a command interface, a graphical interface, preferably a standard one, may be provided by an entity other than the site, for example a command server.

An aspect of some preferred embodiments of the invention relates to an automatic translator for a messaging system. In a preferred embodiment of the invention, the automatic translator replaces code words and/or phrases with content words, or vice versa, either at a sender or at a receiver of the message. One advantage of using code words rather than encrypting the message is that it allows a receiver to understand the message even if he does not have an available decoder. The messages may be entered using a URL field, a WWW page or even an e-mail program.

An aspect of some preferred embodiments of the present invention relates to parsing information entered into a URL address field and determining if this information comprises a URL, an indication of a URL, a command and/or a combination of a command and data for the command.

An aspect of some preferred embodiment relates to modifying an interpretation of data entered into a URL address field and/or by interaction with a WWW display, responsive to a current or previous viewed WWW page and/or responsive to the existence and/or status of other executing programs on the computer. In one example, a user can enter a command into the URL field to upload data from a word processing program to a WWW site. Alternatively or additionally, the commands may be entered into the WWW page directly, for example using a form, or using a JAVA window. Optionally, the commands or other types of WWW interactions may be interpreted responsive to or may be directed to a history of previous commands or previously viewed sites. In one example, a command may be entered to limit the interpretation of future URLs and commands to refer to those sites approved by a certain authority. Possibly, also regular URLs may be modified responsive to such a command. This type of modification is differentiated from the ability to describe a prefix, (the "HREF=" URL command), to be used for referencing partial URLs to. Rather, the modification goes beyond adding a prefix to the URL.

An aspect of some preferred embodiments of the present invention relates to interacting with a first site by addressing commands to a second site, which second site causes said first site to perform a desired action. In a preferred embodiment of the invention, the identity of the second site is transparent to the user and the commands are used to determine the identity of the second site with which the interaction is desired. The actions of the first site are preferably displayed to the user using a WWW page.

An aspect of some preferred embodiments of the present invention relates to a display apparatus for a human interface, in which a display portion is divided into two parts, one part being for entreating commands and a second part for viewing graphically feedback responsive to commands and for entering commands graphically.

An aspect of some preferred embodiments of the invention relates to using a command interface to control a graphical WWW browser. In a preferred embodiment of the invention, the commands are entered into a command line to control one or more of the browser's appearance (e.g., windows, fonts, colors, menus), the browser's interpretation of URLs and/or which pages are retrieved by the browser. In a preferred embodiment of the invention, the commands are entered into an existing text field of the browser, for example a URL field. Alternatively or additionally, an additional text field may be provided, for example by a plug-in or by a separate program. It should be noted that these commands can be used to directly control the browser's behavior, rather to control a different software which merely uses the browser to display

information. In some preferred embodiments of the invention, a multi-line text window is provided for entering commands into the browser.

As used herein, a virtual or electronic personality includes both a static part ("persona") and a dynamic part ("mood"). Technically speaking, both a mood and a persona may have a similar structure: preferences, weights and other aspects as described below. However, in a preferred embodiment of the invention, a persona is used to define a steady state personality which varies slowly, if at all. A mood is preferably used to emulate an instantaneous condition. In a preferred embodiment of the invention, the persona is defined as a structure and the mood defines changes in the structure, especially functional changes. For example, a "meticulous" persona which always desires complete downloads of images, may be modified by a "rush" mood, so that instantaneously it does not require complete downloads. In the applications described herein in which a persona is suggested, a mood may be provided as well or even instead of the persona, in accordance with some preferred embodiments of the invention.

As can be appreciated, the identifying information of the electronic persona may not be the same as the true identifying information of the user, thus providing the user with an ability to anonymously access the Internet.

There is thus provided in accordance with a preferred embodiment of the invention, a method of entering a command, comprising:

providing a WWW browser having a designated URL field;

entering a text string representing a command in a format which is neither a standard URL nor a portions thereof, into said designated URL field; and

translating, by machine, said command into at least one action. Preferably, said command comprises a command to generate a search specification URL. Alternatively or additionally, said command executes a program. Alternatively or additionally, said command modifies the action of an currently executing program. Alternatively or additionally, said command modifies a behavior of said WWW browser. Alternatively or additionally,

said command affects a translation of a future command into an action.

In a preferred embodiment of the invention, said action is carried out by an operating system under which said browser is executing. Alternatively or additionally, said action has a physical manifestation outside of computer hardware. Preferably, said manifestation comprises making a telephone connection. Alternatively, said manifestation comprises printing a file.

In a preferred embodiment of the invention, said action is performed on a same computer as is executing said browser. Alternatively, said action is performed on a computer remote from a computer executing said browser.

In a preferred embodiment of the invention, said command is translated on a same computer as is executing said browser. Alternatively, said command is translated on a computer remote from a computer executing said browser.

In a preferred embodiment of the invention, the method comprises parsing said text to yield said command. Preferably, said parsing is performed on a computer remote from a computer executing said browser. Alternatively, said parsing is performed on a same computer as executes said browser.

In a preferred embodiment of the invention, said action is affected by a context. Preferably, said context affects said translation. Alternatively or additionally, said context affects a parsing of said text into said command. Alternatively or additionally, said context affects one or more parameters associated with said command. Alternatively or additionally, said context comprises a virtual personality associated with a user using said browser. Alternatively or additionally, said context comprises a WWW page displayed by said browser. Alternatively or additionally, said context comprises a state of at least one software package other than said browser. Preferably, said software package is executing on a same computer as said browser.

In a preferred embodiment of the invention, said context comprises a current state of affairs. Alternatively or additionally, said context comprises a history of a state of affairs. Preferably, said history comprises a history of actions by a machine. Alternatively or additionally, said history comprises a history of data display. Alternatively or additionally, said history comprises a history of user input.

In a preferred embodiment of the invention, said command has an effect on future actions dictated by future commands. Alternatively or additionally, said text contains said command in an explicit manner. Alternatively, said text contains said command in an implicit manner. Preferably, said command is determined responsive to an identification of a type of data comprised in the text string.

In a preferred embodiment of the invention, said command comprise a natural language format command. Alternatively, said command comprise a fixed format command.

In a preferred embodiment of the invention, the method comprises displaying a graphical display on said browser responsive to said action. Preferably, said display comprises a result of said action. Alternatively or additionally, said display comprises a status report on said action. Alternatively or additionally, said display is displayed asynchronously.

In a preferred embodiment of the invention, said display is generated on a same computer as is executing said browser. Alternatively, said display is generated on a computer remote from a computer executing said browser.

In a preferred embodiment of the invention, said display comprises a request to clarify said action. Alternatively or additionally, said display is modified in real-time responsive to said command. Preferably, said display comprises a multi-media stream.

In a preferred embodiment of the invention, said display modifies a previously displayed data page on said browser.

There is also provided in accordance with a preferred embodiment of the invention, a method of performing an action, comprising:

providing a text string in a location reserved for a standard URL;

parsing said string to determine a command at a location other than a domain indicated by said string; and

executing said command to perform said action, which action does not comprise data retrieval. Preferably, said string is a standard URL. Alternatively, said string is not a standard URL.

In a preferred embodiment of the invention, providing said text string comprises entering said string in a input field for a URL. Alternatively or additionally, providing said text string comprises providing said string in parameter position reserved for a URL in a network programming language. Preferably, said language comprises Java. Alternatively said language comprises HTML.

In a preferred embodiment of the invention, said browser displays live information from the Internet. Preferably, the remote computers are connected via an Internet.

There is also provided in accordance with a preferred embodiment of the invention, a method of interacting with an existing program, comprising:

executing a browser;

entering a command directed to said program, using said browser, not through a browser interface associated with said program; and

receiving a response to said command from said program. Preferably, said response is displayed by said browser. Alternatively or additionally, said software comprises a software executing on a same machine as said browser. Alternatively, said software comprises a software executing on machine remote from a machine executing said browser. Preferably, said two machines are connected via the Internet.

In a preferred embodiment of the invention, said command is entered into a URL field of said browser. Alternatively, said command is entered by interacting with a graphical display on said browser. Preferably, said graphical display is generated by a program executing on a computer remote from a computer executing said browser.

There is also provided in accordance with a preferred embodiment of the invention, a method of browsing comprising:

providing a WWW browser;

displaying a graphical display of a WWW page using said browser

entering a text command to said browser; and

said browser modifying a behavior thereof responsive to said command. Preferably, said command modifies a display attribute of said browser. Alternatively or additionally, said command modifies a URL interpretation function of said browser. Preferably, said URL interpretation function comprises a URL completion function.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be more clearly understood from the following detailed description of preferred embodiments of the invention, together with the attached figures, in which:

Fig. 1 is a schematic illustration of a browser window, used in accordance with a preferred embodiment of the invention; and

Fig. 2 is a schematic block diagram of a system configuration for command translation and execution, in accordance with a preferred embodiment of the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Fig. 1 is a schematic illustration of a browser window 100, used in accordance with a preferred embodiment of the invention. Window 100 typically includes a menu bar 102, a tool bar 104, a URL entry/display field 106 and a graphical display area 108. In a prior art use of such a window, a user enters a URL into URL field 106 and a data page is retrieved from a remote site an displayed in area 108. In accordance with a preferred embodiment of the invention, a user can enter commands into URL field 106, which commands can interact, in various ways, with the browser and other software, as will be described below in more detail. Various configurations of a system for accepting and responding to such commands are described with reference to Fig. 2. In an exemplary embodiment, the command entered locally is processed, at least partially, at a remote computer and a response to the command is displayed locally as a WWW page, as a JAVA applet, or using other methods of data transfer in the Internet, such as e-mail or file download.

As described in PCT application PCT/IL99/00055, an indication of a URL may be entered into a URL field instead of a URL. This indication is then processed to yield a "correct" URL, which is obtained. Additionally, various mechanisms for completion of URL addresses are known.

In a preferred embodiment of the invention, when information is entered into the URL field this information is parsed to determine its type, for example, to differentiate between commands and URLs or to differentiate between commands and indications of URLs. Various mechanisms may be used to aid in this parsing and identification.

In a first preferred embodiment of the invention, a fixed format is used, for example commands are prefixed with a special code, such as "*". Alternatively, the command language may have a limited number of commands, so that if one of these command-words appears, the information is interpreted as a command, even if such a word could also be interpreted as an indication of a URL. Alternatively, a user may command the system (using this interface or others) to have the URL field function as one or more of a command line, URL field and/or URL indication entry field. Optionally, a command may be entered in a URL-like format, in which the general form is that of a URL, but the interpretation of the content is to perform a command, for example, "http://www.copy.com/XtoY", which means "copy X to Y".

Alternatively, the user can use free-form entry of information and the system analyses the input to determine its meaning. Possibly, some types of interpretations have a priority over other types, for example, commands being preferred to retrieving URLs. Possibly, the system can query the user, using a special window or via area 108, regarding an exact interpretation of the command/URL indication entered. Many methods of parsing free-from information are known in the art and may be used for the purposes described here.

In the art of command languages, many types of command languages are known and may be usefully applied for the purposes described herein. For the purpose of example, one or more of the following methods may be applied:

(a) Natural language, in which a user can enter a substantially free-form command to be executed.

(b) Fixed template languages, in which there are a certain number of keywords, which follow a certain format, such as "copy X to Y".

(c) Flexible template languages, which although they are restricted in the number of keywords, are not restricted to simple templates, but allow aggregate templates, in which the result of one command can be the input of another, or in which the order of words can affect the meaning of the command.

(d) Script commands, conditional statements, procedure definitions and other hierarchical structures for describing more complex actions.

(e) Various types of variables, for example for storing a system state or the results of previous commands.

(f) Command for interacting with the outside world, such as for printing.

Alternatively to entering explicit commands, implicit commands may be entered. In one example a user enters a telephone number, so that the system will dial the number or send an e-mail to that person whose number it is. A particular type of implicit command is a form filling command. If a form is displayed on in area 108, a user may command the system to fill it in. An example of an implicit command is to enter "address #1", which the system will interpret as filling out the address filed with a previously defined address, labeled as "address#1". A further implicit command is to enter "at home" in which case the system will fill in more than one field, using information associated with being "at home", for example telephone numbers and address fields. These associations may be defined as part of a virtual personality, in accordance with a preferred embodiment of the invention. Another exemplary implicit command is to enter "the usual way" in which case the system will determine the usual values for the fields and fill them in. These commands could be prefixed with the key-word "fill-in" to make the command explicit. Alternatively or additionally, the WWW page itself can include an indication to a user that he can enter information using the URL line.

The entered command can affect displays area 108 in many ways, some of which are described below. A generalized WWW page is shown in Fig. 1, which includes

(a) data display 112, which can be graphical and/or text, and which can be used to display command results;

(b) one or more GUI controls 110, such as menu commands or buttons;

(c) one or more graphical maps 114, for entry of mouse position and graphical selections; and

(d) hot links, which retrieve information based on a URL if activated.

Additionally, other types of controls and data displays may be provided, for example as known in the art of user interface design and especially the art of Internet data display and control elements, for example as provided by Java, JavaScript and DirectX.

In a first example of a command interacting with area 108, the displayed page can be used to display what the system understood the user's command to mean, ask for confirmation and/or explain the consequences of performing the command. Alternatively, the display may be used to suggest to the user what commands are most relevant to be applied at any given

moment, As can be appreciated, in some cases, area 108 may comprise two types of information, information from the system and regular WWW information. The two types of information may be displayed side-by-side, such as using a banner or two interaction windows, with one information in a window surrounded by the other or possibly with one information type being overlaid by the other.

In another example, the area 108 may be used to allow a user to modify and/or add details to the command entered by him. The "page" shown in this area may be generated responsive to the command. Alternatively or additionally, a previously displayed page may be used for defining a modification to a command, even before the command is executed. In one exemplary embodiment, a command can be modified by selecting a portion of area 108 to be used in interpreting the command. For example, a "buy this" command can be modified by a selection on area 108 of the object to be bought. Alternatively or additionally, a user can copy a portion of area 108 into the URL area (or a different command area). If it is graphical information which is copied, the pasted text can include an indication of the copied graphic, for example an underlying HTML command or displayed coordinates.

Alternatively or additionally, area 108 is used to provide feedback on the results of the command (e.g., "file copied successfully") or on the progress of the command (e.g., "20 files of 405 files transferred"). Alternatively, such statuses may be displayed in a status line of the browser window (not shown).

Alternatively or additionally, area 108 is used for displaying the effect of the command, for example a retrieved page or a page generated as a result of the command.

Alternatively or additionally, combinations or the above display types may be generated, for example being overlaid or being displayed side-by-side, in separate windows, or as banners.

A recent thrust in software development is the creation of new software packages which include a WWW interface so that they may be accessed over an Internet or Intranet or even on a local computer using a browser. However, older versions of software may not have this capability. Additionally, each software utilizes a different interface. In accordance with a preferred embodiment of the invention, an interface is provided for such WWW-incompliant software, so that it may be accessed over the Internet, Intranet or on a local computer. This interface may be the above-described command interface or it may be a graphical interface implemented on area 108.

The software controlled by the interface may be executed on a local or on a remote computer.

A particular type of software to be controlled via such an interface is the operating system. An example of a command is "copy file1 to location2". Another type of software is production software. An exemplary command is "send the file open in Word to e-mail recipient a@a.com". the interaction may also be between two non-Internet software packages, for example "copy line 2 column 5 of the open spread sheet file to line 20 of the open word processor file".

Various implementations may be used to achieve this type of control over software packages, including, translating the commands into DDE, OLE or DirectX commands (in windows operating systems) and/or simulating user data entry (e.g., keyboard, mouse) into the software. Depending on the implementation used, there may be a large compilation of rules for translating user commands into instructions for software packages. Possibly, a two stage compiler is used in which the user commands are translated into a standardized set of instructions and these instructions are interpreted for each software package according to its needs. Thus, optimization of command performance may be made more efficient. Additionally, this first stage can then be the same for all types of operating systems and software and only the second stage needs to be personalized. Alternatively, the commands are directly translated into the appropriate instruction. Due to the large number of rules, a central data base of translations may be maintained, for example at a remote computer. this remote computer is preferably accessed by computer networking, such as via an Internet. Alternatively or additionally, also the translation process itself may be performed at a remote location. Alternatively, a local copy of the rules and/or the translation program may be maintained, so that the translation is local. Alternatively, the translation process may be broken up between local and remote locations.

In the embodiment where a WWW page is shown to the user for controlling a software package or a WWW page, the "server" of the page is preferably local. However, also a remote server can be used, for example, a remote server which receives the commands and provides instructions to the local computer to control the software package. Alternatively or additionally, a local software unit for translating the commands in provided. however, as described in the above PCT applications, the translation of non-URL entries can also be performed at a remote location, using little or no specialized local software.

As indicated above, such an interface may also be used to control a WWW site, instead of or in addition to an existing (if any) interface. Alternatively or additionally to maintaining a compilation of rules for different sites, which rules describe translations from user commands to site specific commands, the system may analyze the site to detect such mappings. Thus, a user "search command" can be automatically determined to correspond to a "search" button on

a particular page, even if that page does not have a corresponding entry in the compilation of rules. A WWW site may thus be controlled by simulating the effect of activating controls and/or entering text on the WWW page as displayed. Alternatively or additionally, a WWW page may be controlled by sending e-mail or by using a control channel provided by the WWW site. Alternatively or additionally, a WWW page may be controlled by modifying cookies (in response to user commands) and/or other files used by the WWW site to determine its behavior.

Various examples of entering commands at a URL address field and/or other methods of interactions, in accordance with preferred embodiments of the invention will now be described.

In one example, a user enters personal-related information, such as a telephone number, an address, a name or a knock name and the computer makes contact with that person, for example, by dialing, by sending an SMS message, by sending e-mail or by opening a form for entering information for an SMS message or an e-mail message. The type of contact may be a default, may be a property associated with the person contacted or it may be entered by the user as part of the command. The information required for contacting the person and interpreting the command may be locally stored, for example in association with specialized software for the translation. Alternatively, the specialized software looks up the information using local "contacts" software and/or in a database maintained by software other than the browser of the specialized translation software. Alternatively or additionally, the information is retrieved from a remote server.

Alternatively to making contact, the system can display a page having a plurality of information related to the person indicated, such as name, hobbies, address and telephone number and/or a plurality of options for contacting the person. Once such an option is selected, the actual carrying out of the contacting may be delegated to a standard software, such as dialer software or an e-mail program.

In another example, the system can translate an indication of a search into a cgi-bin type URL, so that a remote site generates a particular response page desired. Thus, entering a user's name will send a cgi-bin URL to a yellow-pages server. Alternatively, to a cgi-bin URL, the system can generate other specific URLs, for example a login URL or a URL that requests retrieval from a database. Alternatively, the system can download a file responsive to the indication, instead of or in addition to displaying the file.

Another example of a command in accordance with a preferred embodiment of the invention is entering a product name a service name or an indication thereof and having a page

displayed to allow immediate purchasing of the product or various options and/or offers for purchasing the product. In a preferred embodiment of the invention, a user can pre-select preferred providers at which the system first looks for offers. Preferably, a confirmation of the order is shown in area 108 as a WWW page.

Optionally, the browser, or specialized software associated therewith (possibly the translation software), provide unique identification information, account information and/or encryption services, to assist in electronic commerce activities. Alternatively, such identification information or other personalization information (such as a virtual personality) is used for personalizing the translation and execution of commands using a remote computer.

In another example, a user can enter a name of a computer to direct future commands at the computer. Alternatively, a similar mechanism can be used to achieve the effect of the "HREF=" URL without explicitly entering the command. Rather, when a user enters a partial URL (with or without a command, depending on the implementation) the HREF command is performed. It should be noted that commands could affect future commands in other ways. In one example a user can enter a command to limit the interpretation of future commands to Microsoft products. Thus, a command can differentiate between two open word processors.

In another example, when a user enters a command, the user is provided with a list of other users who have entered the same or a similar command or other information. Possibly the list is sorted and/or filtered, for example using pre-set criteria or based on a virtual personality of the user. Alternatively or additionally, the user is provided with a history of the WWW pages accessed by one or more of those users. Possibly, an average track taken by such other users interested in similar subject is thus provided to the user. Alternatively or additionally, other statistical information regarding the other user's preferences, habits and matching to the user's virtual personality are shown. Thus, a user can track the actions of other users. Preferably, such tracking requires the permission of the other users. Various methods are known in the art to provide a listing of WWW sites being visited by other users. These methods can also be used to store previous visits. Such tracking can also be implemented using a WWW page interface or a different interface instead of or in addition to using a command interface.

In another example, the system analyses the URL field and performs certain actions responsive to the analysis, possibly more than one action. Optionally, the user enters the data using a fixed template and/or order. A user enters "Robert, 15:25, the meeting is next Wednesday". The system translates this indication into a command to send an e-mail notifying Robert of today's appointment changing and into another command to update the scheduler. Possibly, the user can indicate to the system the time at which to send the message as well.

Optionally, the system performs (or delegates to a different software) the task of following up to ensure that Robert acknowledges the message. Thus a plurality of actions can be generated by a single command, the actions being performed in parallel or in series. Once an action starts executing, these is generally no reason for the user to wait before continuing his other activities. However, in some cases, the system will pause until a confirmation can be displayed. Alternatively or additionally, when such a confirmation (or error message or results) is available, the current view in area 108 can be superseded by the newly arriving information. Alternatively, a new window opens. Alternatively or additionally, a message appears in a separate message window, allowing the user to save his work, before viewing the newly arrived information.

In another example, a user can enter command and parameters for the commands. A user can enter "find me a Sony TV costing between $100 and $200". The system can translate this command into a search in certain WWW sites. Alternatively, the system can transfer the command (with or without reformatting) to an automated WWW agent or site, to perform the search. The results are preferably displayed by the browser, so that a user need not be aware of the existence of the agent or site. Alternatively, the results are displayed by the agent or by the site. Other examples of such commands include "send an acknowledgment to Robert", which command is preferably translated based on the context (e.g., open WWW page, open e-mail, last few commands and/or an outstanding letter from Robert; "search for sites having to do with Alaska", which may be implemented by sending the natural language string, with a suitable format change directly to a search engine; "find an article titled bad boys that appeared in the New York Times last year, maybe on page A15", which is preferably executed by a dedicated search agent; and "buy Microsoft Stock at a limit or 1.5%", which is preferably transmitted to a stock broker.

The current context which can be utilized by the translator can include one or more of the current active files, the contents of files on the local computer, a virtual personality, the identification and current state of software running on the local or on a remote computer, a history of actions and/or displays of such software and/or the browser itself and/or statistics over time or users of such information. Many methods are known in the art for retrieving such information using software which is running on the local computer, including hooks in the operating systems to capture input and output commands, copying and analyzing the display and patching into software using tattletales which generate real-time reports or log-files on the current status of the software. In addition, there are various system tables which may contain the desired information. Information from the Internet is preferably, but not necessarily

provided by a server through which the information passes and/or which monitors traffic on the Internet. In an exemplary embodiment, output from a program which had commands forced on it by a browser, is captured by hooking onto operating system output commands and then the output is displayed in the browser. Alternatively, an indication of the output or an indication that such output exists may be displayed by the browser. Possibly, the output window of the software is copied onto the browser display.

In another example, a user can use a command to inform the browser of his current mood (e.g., "I am sad" or "I am bored"), to affect the interaction of the browser and/or of the Internet itself with the user.

In another embodiment, the translation can extend to enciphering a text message. A user can type in to the URL field: "tell Robert to stop the negotiations". This message may be secret. The translator can encipher this message, for example to "green apple" When Robert receives the message "green apple" he can know it means to stop the negotiations. Optionally, Robert has a reverse translator that replaces "green apple" with "stop the negotiation". Alternatively, the user can type "green apple" to begin with and it is translated by Robert's machine. This type of cipher can also be used for non-URL field messages, for example for e-mail or for information entered on a WWW page.

The above command methods can also be used to control dynamic information, especially multimedia, such as sound, graphics and image streams. For example entering a command "pan 20" into a command line while viewing a live camera stream can e used to make the camera pan 20 degrees to the left. Alternatively or additionally, the command scan be used for dynamic control of static information, for example, a command "zoom 1.5" when an image is being viewed will retrieve (or locally zoom) a suitable enlargement.

In some cases security may be a problem. Allowing a URL to activate commands on a user's computer and manipulate files can have unwanted effects. A villain may put such URLs into a innocuous looking WWW page and the user, when he views the page may damage his system, for example causing it to erase critical files, by activating a hidden URL-command. In a preferred embodiment of the invention, the system may be configured not to execute commands that are not generated on the local computer. This may be achieved, for example, by requiring the command to include a digital signature. Alternatively commands that are suitable authorized, (e.g., have a digital signature or other authorization appended thereto) and which arrive from a remote location may also be approved. Alternatively or additionally, commands and/or translations of the commands which are transmitted between the local computer and a

remote server (Fig. 2, below) may also be encrypted and/or signed, to assure that they are not tampered with and/or read by unauthorized individuals.

As used herein the term system is used to convey the collection of software and hardware which receives a command, translates it and instructs suitable other software to carry out a desired action. Various configurations, distributed and centralized can be envisioned.

Fig. 2 is a schematic block diagram of a system configuration 200 for command translation and execution, in accordance with a preferred embodiment of the invention. A client 202 comprises a browser 204 and a command interface 206, for capturing commands. When a user enters the command, the command is preferably captured by the command interface, however, as noted above, command capture does not require a dedicated command interface, for example a DNS server or a proxy server can also capture commands as being "invalid" URLs. The command may be designated to affect a local storage 208 or a remote target computer 214, which may be accessible by Internet or by other computer networking means. Each captured command is generally parsed, translated into instructions, usually implementation-dependent, the instructions performed and then the results are optionally displayed. Any one of these activities can be performed at any one of client 202, remote processor 210, remote target computer 214 or a remote page generator 21, depending on the implementation. Additionally, a single task may be split between two or more computers and/or locations. In an exemplary embodiment, the command is parsed at client 202, translated at remote processor 210, performs actions at remote target computer 214 and a response page is generated by page generator 214. Any or all of these computers may be connected via the Internet, an Intranet, a LAN or other computer communication methods. Additionally, any of the above computers may contain the information required to properly process the command, for example personal information, rule compilations or a compiler. It should be noted that having a remote computer process the commands allows client 202 to maintain privacy if desired. Further, as only the remote computer is aware of his identity, the remote computer is the only one who can build a profile of the user habits and/or target advertisements to the user, for example as part of the result pages. Possibly, viewing the entire results forces the user to perform some desirable action, such as viewing an advertisement or answering questions.

In a preferred embodiment of the invention, command interface 206 is implemented as a plug-in. Alternatively, it is a separate program, for example incorporating TCP/IP stack. Other implementations are also possible, for example as described in the above PCT applications. Although general purpose computers are contemplated, in some preferred

embodiments of the invention, a special purpose computer may be used for one or more of the elements in Fig. 2.

The term "URL", as used herein is directed at the common designation, i.e., a standard method of describing an Internet resource, and a few add-ons which do not specifically denote resources, such as "Mailto". As of the date of filing of this application, there is a common URL standard. Changes in this standard which may be currently contemplated (publicly) are also considered to be within the scope of the definition of "URL". It is anticipated that changes in standards will occur and the exact format of URLs will change. To the extent that these changes are to make the new URL within the scope of the invention, the term URL is not intended to include such extensions, rather these extended URLs are considered to be non-standard URLs. However, changes which relate to the designation of particular resources on the Internet are considered to be within the scope of the definition of "URL".

An aim of some preferred embodiments of the invention is to require a minimum amount of specialized software or modification of the browser, although this is not required. Additionally, in some embodiments of the invention, there is an aim to minimize changing the functional behavior of a browser, excepting what is needed to provide the above functionality. However, in some embodiments of the invention, some modifications of the browser functionality are provided. On example of such a change is to make a default location of the cursor when a new page is displayed, be in the URL field rather than in the displayed page. Another possible modification is to allow the URL field to display information, such as a command, which does not match a current URL. In some embodiments, the page display will not be affected even if a user sent the command to be executed.

The above description has centered on WWW browsers, however, the scope of some embodiments of the invention also covers other types of software and especially software for remote interaction, for example e-mail software. In the example of e-mail software, a user can type a command (e.g., to the software, to other software, to a remote site) into the address field or into the subject field. These commands are not directed to the recipient of the e-mail, rather these commands are captured, either locally or at a mail server, and are used to affect the remote or a local interaction, as described above. Additionally, the scope of some embodiments of the invention extends to cover other software in which a command line and a graphical display area are available and a user uses the software as a single interface to a large plurality of other software packages, local and/or remote. In some such software, the command line may be implemented as a handwriting input field.

It should be noted that using commands and URL indications in the place of URLs in accordance with some preferred embodiments of the invention is not limited to the URL address field. Rather, in accordance with some preferred embodiments of the invention, various types of URL address indications, for example key words for matching against a database of associations, and commands, may be used in place of URLs in automated scripts, such as HTML, Java, and JavaScript. As a result, when a WWW site generates a personalized page, the site can replace a URL with a command or an indication of a URL and this command or indication will be translated by the client computer, into the required action. This type of replacement is useful, for example for hyper links and for designating URLs to be activated on when a control is clicked. Possibly, but not necessarily, the command is camouflaged to have a form like a URL (e.g., "http://a.a.com/copyXtoY") so that computers which do not have access to suitable translation software will not generate an error message. Rather, when the URL reaches the server, the server can perform the personalization, execute the command or generate a response of a different kind. Thus, a WWW site can provide personalized page actions without access to the actual personal information. rather, the action indications are translated at the sure computer using the locally or remotely stored personal information which is not available to the WWW site.

It should be appreciated that some of the above embodiments of the invention may also be implemented using menus or other graphical interface elements and are also considered to be within the scope of the invention. Alternatively or additionally, voice commands and/or other user interaction methods may be used. This is especially true for those embodiments which go beyond replacing graphical interactions via area 108 with commands in the URL field. However, particular preferred embodiments of the invention, require that the commands be entered in the URL field.

It will be appreciated that the above described methods of computer interfacing may be varied in many ways, including, changing the order of steps, which steps are performed on-line and which steps are performed off-line and where the steps are performed. In addition various distributed and/or centralized configurations may be used to implement the above invention, preferably utilizing a variety of software tools. In addition, a multiplicity of various features, both of methods and of devices have been described. It should be appreciated that different features may be combined in different ways. In particular, not all the features shown above in a particular embodiment are necessary in every similar preferred embodiment of the invention. Further, combinations of the above features are also considered to be within the scope of some preferred embodiments of the invention. Also within the scope of the invention are computer

readable media on which software, for performing part or all of a preferred embodiment of the invention, are written. It should also be appreciated that many of the embodiments are described only as methods or only as apparatus. The scope of the invention also covers hardware and/or software adapted and/or designed and/or programmed to carry out the method type embodiments. In addition, the scope of the invention includes methods of using, constructing, calibrating and/or maintaining the apparatus described herein. When used in the following claims, the terms "comprises", "comprising", "includes", "including", "having" or their conjugates mean "including but not limited to".

It will be appreciated by a person skilled in the art that the present invention is not limited by what has thus far been described. Rather, the scope of the present invention is limited only by the following claims.

CLAIMS

1. A method of entering a command, comprising:

providing a WWW browser having a designated URL field;

entering a text string representing a command in a format which is neither a standard URL nor a portions thereof, into said designated URL field; and

translating, by machine, said command into at least one action.

2. A method according to claim 1, wherein said command comprises a command to generate a search specification URL.

3. A method according to claim 1, wherein said command executes a program.

4. A method according to claim 1, wherein said command modifies the action of an currently executing program.

5. A method according to claim 1, wherein said command modifies a behavior of said WWW browser.

6. A method according to claim 1, wherein said command affects a translation of a future command into an action.

7. A method according to claim 1, wherein said action is carried out by an operating system under which said browser is executing.

8. A method according to claim 1, wherein said action has a physical manifestation outside of computer hardware.

9. A method according to claim 8, wherein said manifestation comprises making a telephone connection.

10. A method according to claim 8, wherein said manifestation comprises printing a file.

11. A method according to claim 1, wherein said action is performed on a same computer as is executing said browser.

12. A method according to claim 1, wherein said action is performed on a computer remote from a computer executing said browser.

13. A method according to claim 1, wherein said command is translated on a same computer as is executing said browser.

14. A method according to claim 1, wherein said command is translated on a computer remote from a computer executing said browser.

15. A method according to claim 1, comprising parsing said text to yield said command.

16. A method according to claim 15, wherein said parsing is performed on a computer remote from a computer executing said browser.

17. A method according to claim 15, wherein said parsing is performed on a same computer as executes said browser.

18. A method according to claim 1, wherein said action is affected by a context.

19. A method according to claim 18, wherein said context affects said translation.

20. A method according to claim 18, wherein said context affects a parsing of said text into said command.

21. A method according to claim 18, wherein said context affects one or more parameters associated with said command.

22. A method according to claim 18, wherein said context comprises a virtual personality associated with a user using said browser.

23. A method according to claim 18, wherein said context comprises a WWW page displayed by said browser.

24. A method according to claim 18, wherein said context comprises a state of at least one software package other than said browser.

25. A method according to claim 24, wherein said software package is executing on a same computer as said browser.

26. A method according to claim 18, wherein said context comprises a current state of affairs.

27. A method according to claim 18, wherein said context comprises a history of a state of affairs.

28. A method according to claim 27, wherein said history comprises a history of actions by a machine.

29. A method according to claim 27, wherein said history comprises a history of data display.

30. A method according to claim 27, wherein said history comprises a history of user input.

31. A method according to claim 1, wherein said command has an effect on future actions dictated by future commands.

32. A method according to claim 1, wherein said text contains said command in an explicit manner.

33. A method according to claim 1, wherein said text contains said command in an implicit manner.

34. A method according to claim 33, wherein said command is determined responsive to an identification of a type of data comprised in the text string.

35. A method according to claim 1, wherein said command comprise a natural language format command.

36. A method according to claim 1, wherein said command comprise a fixed format command.

37. A method according to claim 1, comprising displaying a graphical display on said browser responsive to said action.

38. A method according to claim 37, wherein said display comprises a result of said action.

39. A method according to claim 37, wherein said display comprises a status report on said action.

40. A method according to claim 37, wherein said display is displayed asynchronously.

41. A method according to claim 37, wherein said display is generated on a same computer as is executing said browser.

42. A method according to claim 37, wherein said display is generated on a computer remote from a computer executing said browser.

43. A method according to claim 37, wherein said display comprises a request to clarify said action.

44. A method according to claim 37, wherein said display is modified in real-time responsive to said command.

45. A method according to claim 44, wherein said display comprises a multi-media stream.

46. A method according to claim 37, wherein said display modifies a previously displayed data page on said browser.

47. A method of performing an action, comprising:

providing a text string in a location reserved for a standard URL;

parsing said string to determine a command at a location other than a domain indicated by said string; and

executing said command to perform said action, which action does not comprise data retrieval.

48. A method according to claim 47, wherein said string is a standard URL.

49. A method according to claim 47, wherein said string is not a standard URL.

50. A method according to any of claims 47-49, wherein providing said text string comprises entering said string in a input field for a URL.

51. A method according to any of claims 47-49, wherein providing said text string comprises providing said string in parameter position reserved for a URL in a network programming language.

52. A method according to claim 51, wherein said language comprises Java.

53. A method according to claim 51, wherein said language comprises HTML.

54. A method according to any of claims 1-46, wherein said browser displays live information from the Internet.

55. A method according to any of claims 12, 16 or 42, wherein said remote computer communicates with said browser over the Internet.

56. A method of interacting with an existing program, comprising:

executing a browser;

entering a command directed to said program, using said browser, not through a browser interface associated with said program; and

receiving a response to said command from said program.

57. A method according to claim 56, wherein said response is displayed by said browser.

58. A method according to claim 56, wherein said software comprises a software executing on a same machine as said browser.

59. A method according to claim 56, wherein said software comprises a software executing on machine remote from a machine executing said browser.

60. A method according to claim 59, wherein said two machines are connected via the Internet.

61. A method according to any of claims 56-60, wherein said command is entered into a URL field of said browser.

62. A method according to any of claims 56-60, wherein said command is entered by interacting with a graphical display on said browser.

63. A method according to claim 62, wherein said graphical display is generated by a program executing on a computer remote from a computer executing said browser.

64. A method of browsing comprising:
providing a WWW browser;
displaying a graphical display of a WWW page using said browser
entering a text command to said browser; and
said browser modifying a behavior thereof responsive to said command.

65. A method according to claim 64, wherein said command modifies a display attribute of said browser.

66. A method according to claim 64, wherein said command modifies a URL interpretation function of said browser.

67. A method according to claim 66, wherein said URL interpretation function comprises a URL completion function.

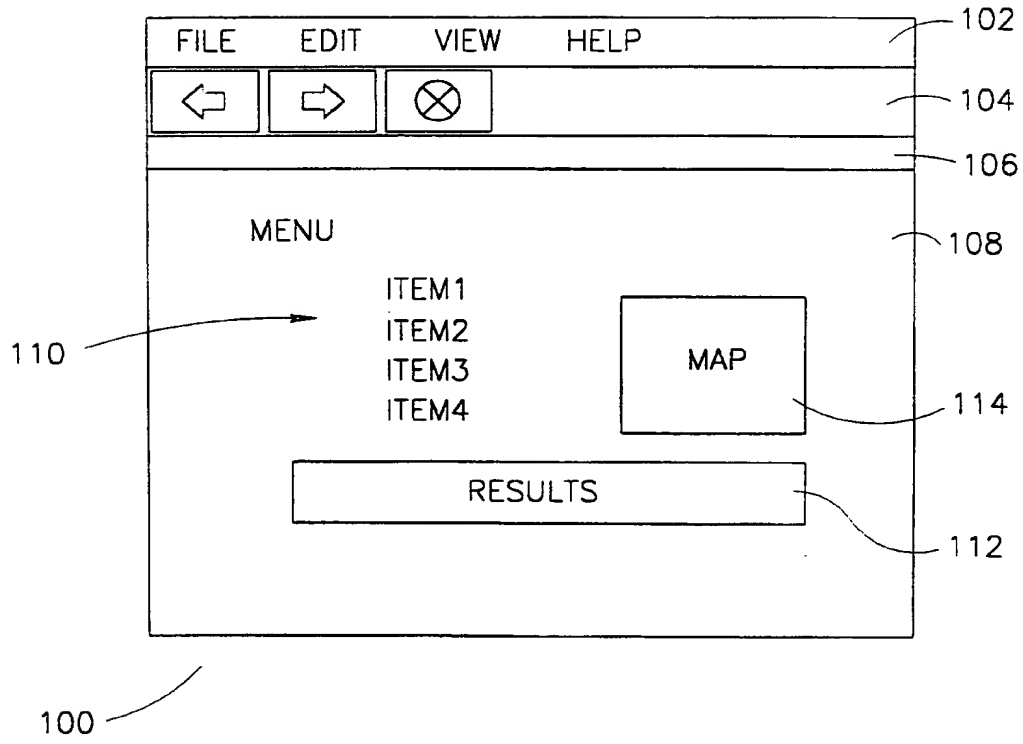

FILE
EDIT
VIEW
HELP
102
104
106
MENU
108
ITEM1
ITEM2
ITEM3
ITEM4
110
MAP
114
RESULTS
112
100

FIG.1

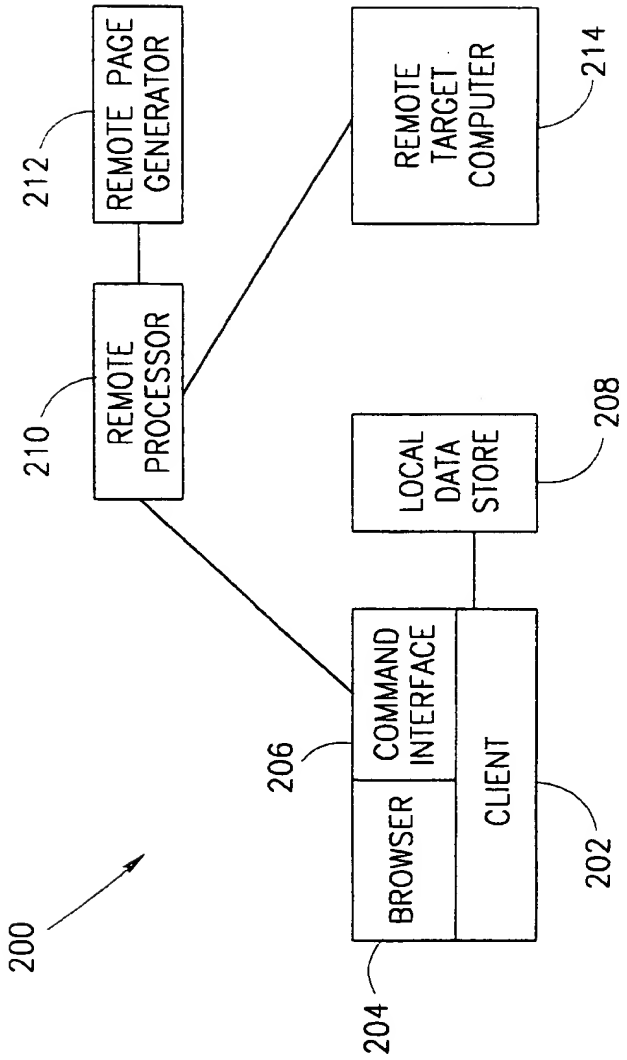

200
BROWSER
CLIENT
COMMAND INTERFACE
LOCAL DATA STORE
REMOTE PROCESSOR
REMOTE PAGE GENERATOR
REMOTE TARGET COMPUTER
202
204
206
208
210
212
214

FIG.2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IL99/00433

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :G06F 17/00
US CL : 707/102, 501, 100

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 707/102, 501, 100

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WEST search terms: command, browser, string, parse, translate

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A, E	US 5,987,506 (CARTER et al.) 16 November 1999, abstract	1-67

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 30 NOVEMBER 1999	Date of mailing of the international search report 22 DEC 1999
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer DAVID JUNG James R. Matthews Telephone No. (703) 308-5262

Form PCT/ISA/210 (second sheet)(July 1992)*